REMARKS

In the Office Action, the Examiner rejected the claims under 35 USC §102. The claims have been amended in response to the claim objections and to further clarify the subject matter regarded as the invention. The rejections are fully traversed below. Claims 1 and 3-52 remain pending.

Reconsideration of the application is respectfully requested based on the following remarks.

REJECTION OF CLAIMS UNDER 35 USC §102

In the Office Action, the Examiner has rejected the claims under 35 USC §102(e) as being anticipated by Blumenau, U.S. Patent No. 6,260,120, ('Blumenau' hereinafter). This rejection is fully traversed below.

Blumenau relates to storage mapping and partitioning among multiple host processors in the presence of login state changes and host controller replacement. See title. A storage controller is programmed to define a respective specification for each host processor of a respective subset of the data storage to which access by the host processor is restricted, and each specification is associated with a host identifier stored in the memory. When the storage controller receives a data access request from a host processor, it decodes a host identifier from the data access request, and searches the memory for a host identifier matching the host identifier decoded from the request. Upon finding a match, the respective specification of the respective subset for the host processor is accessed to determine whether or not storage specified by the storage access request is contained in the respective subset. If so, then storage access can continue, and otherwise, storage access is denied. Preferably, the host identifier decoded from the request is a temporary address assigned by the network, and also stored in the memory in association with each respective specification is a relatively permanent identifier for the host processor. See Abstract.

Various embodiments of the invention support the implementation of virtualization of storage within a storage area network through a virtual enclosure. See title. For instance, independent claim 1, as amended, recites:

A method of implementing storage virtualization in a storage area network, the method comprising:

creating a virtual enclosure, the virtual enclosure having one or more virtual enclosure ports and being adapted for representing one or more virtual storage units, each of the virtual storage units representing one or more physical storage locations on one or more physical storage units of the storage area network;

associating each of the virtual enclosure ports of the virtual enclosure with a port of a network device within the storage area network, thereby enabling one or more network devices within the storage area network to be associated with the virtual enclosure ports; and

assigning an address or identifier to each of the virtual enclosure ports; wherein associating each of the virtual enclosure ports of the virtual enclosure with a port of a network device within the storage area network includes comprises:

sending a message from a first network device to a port of a second network device within the storage area network to instruct the port to handle messages addressed to the address or identifier assigned to the associated virtual enclosure port.

Since a virtual port may be implemented by a port of any network device within the storage area network, a network's virtualization capacity may scale with the number of ports in the network. Moreover, sending a message to a port of a network device within the storage area network enables virtualization within a storage area network to be dynamically established.

Blumenau neither discloses nor suggests the claimed invention. Blumenau does disclose the use of virtual ports and the use of volume partitioning by virtual ports. See col. 23, line 47-col. 25, line 67. However, as shown in Fig. 22 and described in col. 26, lines 1-24, a cached storage subsystem 250 implementing virtual ports 268 includes two port adapters 260 and 261, each having two physical ports. The port adapters are programmed to provide respective virtual switches linking their physical ports to a set of virtual ports. As shown in Fig. 7, the cached storage subsystem 20 appears to include a single network device having a cache memory 32 accessible by both port adapters. This is further emphasized in

col. 9, lines 25-29, stating "in a preferred form of construction, the cache memory 32 is composed of dynamic RAM memory cards mounted in a card-cage or main-frame, and the port adapters and storage adapters are programmed micro-processor cards that are also mounted in the card-cage or main-frame." Since the virtualization and physical ports of Blumenau are implemented in a single device, Blumenau neither discloses nor suggests "sending a message from a first network device to a port of a second network device within the storage area network to instruct the port to handle messages addressed to the address or identifier assigned to the associated virtual enclosure port." The Examiner cites col. 25, lines 29-49. However, Blumenau merely discloses the programming of the port adapter of the cached storage subsystem 20, referring to programming "microcode," not the sending of a message to the port adapter. As a result, Blumenau fails to support the implementation of virtualization among any number of network devices within a storage area network. Moreover, Blumenau fails to support the dynamic implementation of virtualization of storage within a storage area network through the use of such messages. Accordingly, Blumenau fails to anticipate the claimed invention.

The Examiner cites col. 24, lines 10-33 in the most recent rejection, and continues to maintain the prior rejections of the pending claims. It is important to note that col. 24, lines 10-33 disclose the concept of a virtual port. However, as set forth in col. 24, lines 25-33, the "port adapter providing the physical port is programmed to function as an FL_Port, E_Port or F_Port..." In other words, the instruction of a physical port to function on behalf of a virtual port as set forth in Blumenau is not dynamic. Rather, the physical port is merely programmed to operate in this manner.

As recited in the pending claims, a separate network device (e.g., virtual enclosure server) operates to instruct a physical port of another network device to act on behalf of a virtual port. Thus, this separate network device sends a message to the physical port. Blumenau fails to disclose or suggest such a dynamic system. In fact, Blumenau fails to disclose sending messages such as bind or trap messages, as claimed. The terms "bind" and "trap" are described at various points in the specification. For instance, the terms "bind" and "trap" are described at lines 1-13 of page 7 of Applicant's specification. A port that is instructed to "bind" itself to the virtual enclosure port acts as the virtual enclosure port. A "trapping port" is an additional port that may also handle messages that are directed to the virtual port.

The remaining independent claims are patentable for similar reasons. Applicant

therefore respectfully submits that Blumenau fails to anticipate the independent claims. The dependent claims depend from one of the independent claims and are therefore patentable for at least the same reasons. However, the dependent claims recite additional limitations that further distinguish them from Blumenau.

For instance, claim 14 recites "assigning one or more virtual storage units to the virtual enclosure." The Examiner cites col. 24, lines 34-55. However, it is important to note that Blumenau requires that a host be associated with one or more virtual ports (for volume partitioning). In contrast, the claimed invention creates a virtual enclosure independent of hosts that may access the virtual storage units. As such, Blumenau fails to operate in the claimed manner. Accordingly, Applicant respectfully submits that claim 14 is patentable over the cited art.

The additional limitations recited in the independent claims or the dependent claims are not further discussed, as the above discussed limitations are clearly sufficient to distinguish the claimed invention from the cited reference. Thus, it is respectfully requested that the Examiner withdraw the rejection of the claims under 35 USC §102.

SUMMARY

If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

Applicants hereby petition for an extension of time which may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-0388 (Order No. ANDIP007).

Respectfully submitted,
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